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# Healthcare Technologies For Older People: What Do Physicians Think?

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**Abstract.** This paper presents the results of a small survey of clinicians in Northern Ireland. The survey sought to examine attitudes towards the use of healthcare technologies in everyday medical practice. Replies were received from 37% of those surveyed. The majority of replies came from consultants, fully trained and accredited in their speciality, representing senior opinions in their field. The survey revealed that while the level of interest in specific domains of health technology use in the older person was consistently high, those surveyed exhibited poor knowledge and indeed actual use of health technology.

**Keywords.** Healthcare technologies, Alzheimer Care, survey

## Introduction

One of the most common questions asked by a clinician when hearing of the latest advance in healthcare technology is “what is its relevance to everyday medical practice?” There is a notion amongst the medical community that technological applications are often no more than gadgets, a showcase for scientific talent with little obvious bearing on what happens on the ground in hospital wards, homes and care institutions. Involved clinicians have long sought to employ emerging technological applications as they would offer medications or physical interventions as delivered by the multi-disciplinary team - what about their less interested colleagues? Are these attitudes prevalent and should the technical community be concerned? How much do physicians know about available healthcare applications in their field and how much do they want to know?

Within the realms of technologies to support independent living within the home environment we are faced with a number of opportunities to introduce future and emerging technological solutions. These opportunities are fuelled by global changes in demographics, associated social and economic implications and increases in the number of persons suffering from chronic diseases or disabilities. Nevertheless, if solutions are developed from a technical perspective will physicians wish to know about them and more importantly, will they wish to deploy them?

## 1. An Example from Alzheimer Care

The Everyday Technologies for Alzheimer Care (ETAC) consortium have identified a number of priority areas within which they have raised open research questions to

prompt the development of technological solutions to aid those suffering from Alzheimer's Disease (AD) . Although these have been specifically identified as opportunities to engage in the development of technologies for those suffering from AD, we have tried to generalise the topics identified to within the broader realms of supporting independent living in the home environment. Our interpretation of these opportunities is as follows:

- Behavioural analysis for the early detection of disease onset. In this category the opportunity exists to develop technological solutions which have the ability to analyse behavioural patient data and from this identify the early detection of certain pathological conditions.
- Prevention of disease onset. Within this category a potential opportunity exists to develop solutions which can be deployed within the home environment which have the ability to delay or prevent disease onset.
- Support for Stakeholders. Surrounding the support infrastructure for independent living is a large network of healthcare and social carers, for whom an improved means of maintaining contact with the patient would be beneficial.
- Personalisation of technological support. By analysing user interactions and behaviours within the home environment provides the opportunity to tailor service deliver on a person-by-person basis and truly offer a means of personalised independent living.
- User interfaces and interaction with technologies. Users may interact with the surrounding environment via a number of different means, however, to date it is not well appreciated within which contexts these should be deployed.

As we now have an appreciation for the potential scope of the introduction of technology and also an appreciation for the physicians' potential perspective on its use, the study presented in the remainder of this paper describes the analysis of information collected via a set of questionnaires distributed to a local group of hospital-based medical personnel.

## **2. Methods**

In our field of special interest, healthcare technologies applied to ageing people and their use in the promotion of independence and disease minimisation, we sought opinions from senior hospital-based medical personnel from the fields of Elderly Care Medicine and Psychiatry of Old Age who work throughout the UK National Health Service within Northern Ireland. In particular, we questioned their views regarding their level of existing knowledge of healthcare technologies and the influence that such knowledge has on their clinical practice currently. We also asked how the influence of technologies on the physicians' clinical practice might change over the next five years, expectant, as we are, that the awareness and use of technologies in this field is set to increase. We were especially interested in surveying those specific areas of clinical practice in which technological advancements could have the greatest impact.

The questions were introduced with the following assertion, *"What do we mean when we talk about health technologies for older people? This is the rapidly evolving development of technologies that can improve the ageing experience in the UK. The focus is on how technologies can improve the quality of life for the elderly and reduce*

*healthcare costs.*” Subjects were identified during January 2006 from the invitation roll of the Annual 2006 Joint British Geriatrics Society/Old Age Psychiatrists Northern Ireland Meeting. Replies were sent via an online reply service or by conventional postal mail. In all, 66 Elderly Care Specialists including Consultants, Specialist Registrars, Staff Grades and Senior House Officers were invited, by email, to reply. Twenty Psychiatrists of Old Age, of similar grades, were also sent an email asking them to participate.

### 3. Results

Replies were received from 32 out of 86 potential returns (37%). Twenty-three Elderly Care Physicians, 7 Old Age Psychiatrists and 2 Others, representing medical guests not belonging to either specialty, replied. Twenty Consultants, 8 Specialist Registrars and 4 Others (Staff Grade or Senior House Officer Grade) participated in the survey.

Eight individual questions were posed and the replies are outlined as shown in Figure 1 below.

The first question attempted to quantify the participants’ present level of knowledge of health technologies applicable to patients in their field. The question asked if they agreed with the statement, “I have a good existing knowledge of available health technologies for older people”, the most common answer was “Disagree” entered by 16/32 (50%) of the participants. Of note, only 5/32 (16%) of participants “Agreed” with this statement; none entered “Strongly agree”. Similarly, only 6/32 (19%) replies were “Agree” in response to the statement that their clinical practice is influenced by opportunities to utilise health technologies. There were no “Strongly agree” responses and the majority of clinicians (20/32 (63%)) were negatively disposed in this regard answering either “Disagree” or “Strongly disagree”. Question 8 followed-up on this issue and asked the physicians if they agreed with the statement “Over the next five years, my clinical practice is likely to change as a result of advancements in health technologies for older people”. Only 5/32 (16%) answered in the negative. Eight out of 32 (25%) were of no opinion, while 19/32 (59%) “Agreed” or “Strongly agreed”.

Of the five key areas of technological advance we questioned the participants on, namely disease prevention, early disease detection, medication compliance, remote care giving/family support and management of multiple morbidities (i.e. multiple disease states), respondents were challenged that they had an interest in each domain. No one replied with “Disagreed” or “Strongly disagreed” to any of these questions. The category with the highest number of strongly positive replies was in relation to how health technologies might improve medication compliance and in the management of multiple morbidities. In both these domains 14/32 (44%) of participants entered “Strongly agree”. The least positive set of replies was recorded in the category of early disease detection – only 10/32 (31%) entered “Strongly agree” in reply.

An ANOVA-based comparison of means was unable to reveal any differences in the nature of the replies according to the grade of hospital physician. Similarly, there were no significant inter-disciplinary differences between the replies of Elderly Care physicians and their Psychiatry colleagues.

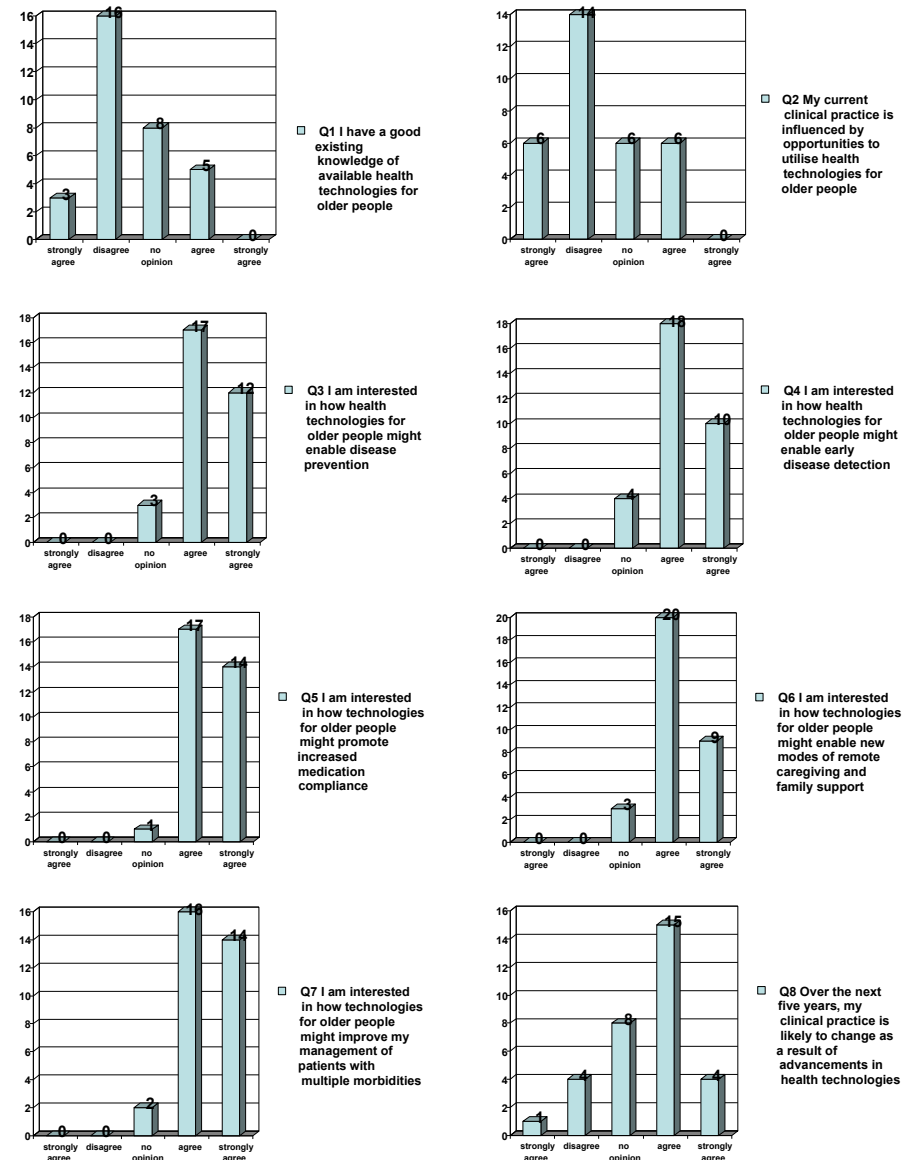


Figure 1. Analysis of the eight questions completed within the received questionnaires

#### 4. Discussion

Surveys of physicians' views of the use of innovations in healthcare technology are relatively sparse and outnumbered by corresponding assessments of patient/user

opinions [1-3]. In this study, thirty-two replies were received, mostly from physicians in Elderly Care Medicine. The majority of replies came from consultants, fully trained and accredited in their speciality, representing senior opinions in their field. Interestingly, there was no apparent difference in the nature of the responses when views of consultants were compared to their younger counterparts; who it could be argued, might have been more sympathetic to the culture of technology use in medical practice. Neither were differences between specialties detected. One may have expected that the physician group of Elderly Care specialists, would exhibit greater understanding and familiarity of health technologies as their patient group remain potential users of established technologies, relevant to cardiology, respiratory medicine and physical medicine (by way of examples), and which can easily apply through to the older person domain.

The groups' current state of knowledge and indeed use of health technology was disappointingly poor. These introductory questions were deliberately broad and while we wished to avoid artificially compressing the scope of the questionnaire we acknowledge that the vague nature of the questions may have influenced the replies towards the "disagree" end of the visual analogue scale. Participants may have had difficulty knowing what is meant by the term "health technologies" which is clearly wide-ranging although the focus was toward the application of health technology in older people. The first web portal of call for most physicians, including those surveyed herein, would most likely be the NHS Health Technology Assessment (HTA) Programme [4] (although this is an assumption and perhaps the basis for further study). Within the site, formal assessments of various technological applications are available and one is struck by the comprehensive array of applications which fall under the "health technology" umbrella ranging from assessment of cardiac pacemakers, to drug efficacy and to assessments for Quality of Life tools [5].

#### *4.1. Opportunities for Curriculum Development*

The corpus of knowledge held by a doctor is likely to be influenced by medical school learning programmes which typically provide some coverage of medical informatics and the use of the Internet in patient care [6] but little else unless the technology or device has become fully established and accepted; MRI scanning being one example. Within elderly care, innovative strategies to develop cognitive prosthetics or sensor-based algorithmic models of Parkinson's disease medication management are taking place but faculty personnel would be understandingly upset if precious learning time devoted to core topics of immobility and mental impairment were replaced by "radical" modules in these areas. We believe though that gaps will appear, via the mechanism of the student-selected component or module, to introduce these exciting topics to the doctors of tomorrow.

Knowledge and use of technologies in qualified clinicians is similarly influenced by how professional bodies treat the topic. The British Geriatrics Society, for example, the professional body representing the education and interests of senior Elderly Care physicians have also addressed the growing field of medical informatics with the establishment of a "Telecare and Telehealth Special Interest Group" [7] and one hopes for greater representation in the area of medical device development and its application to the elderly in this group in future.

#### *4.2. Patient or Person – are Technological Developments Disease-inclusive?*

The survey revealed that the level of interest in specific domains of health technology use in the older person was consistently high. The respondents generally believed there would be, over the course of the next five years, an increase in the influence that health technology would have on their clinical practice. Interest was most intense in the domains of medication management and management of multiple disease states, two hugely challenging areas in everyday clinical practice. The high level of interest expressed in all the areas represented in the survey namely disease prevention, early disease detection, medication compliance, remote care giving/family support and management of multiple morbidities (i.e., multiple disease states) compared to the low level of the physicians' current knowledge and application of health technologies may reflect a key issue that health technologists, particularly those involved in the field of maintenance of independent living/ambient assisted living, may be failing to address. This is the question of whether technologies are disease-inclusive. Technologists will no longer be accused of show-casing by clinicians where proposals remain cognoscente of the key fact that significant loss of independence in old age is disease-related and that neither age, nor age-related loss of physiological function, is sufficient, in itself, to jeopardise mobility and functional activities of daily living to the degree that independence is threatened and institutionalisation considered. One of the key concerns of the ICOST community is to maintain the quality of life and independence of older people and what physician would disagree with these aspirations? Yet therein lies the difficulty, people do not lose independence, patients do. It might not be fashionable, but setting technology-related agendas for people ignores the unavoidable truism that individuals do not require help and the activation of strategies that aim to minimise dependency and avoid institutionalisation because they suddenly reach their 80th birthday, rather the major morbidities of old age e.g., dementia, stroke, osteoarthritis, macular degeneration, drug effects, have arrived to impair the person in key areas of independent functioning.

### **5. Conclusions**

Research would indicate that older people are generally fiercely reluctant to yield to the pathological vagaries of old age which lead to changes in vision and hearing, balance and clarity of thought etc, etc. Naturally, one seeks to keep possession of one's independence for as long as possible, to do otherwise is to admit defeat. We would potentially suggest that technologists are doing a disservice to older people in ignoring clinical variables and shaping assistive-living technologies around normal physiological decline. This approach also represents a missed opportunity for engineers; design for all is attractive and driven by market influences but the real-life usefulness can fall as the end-user's definition broadens. Physiotherapy is largely wasted on an elderly person if he/she has untreated Parkinson's disease. Similarly, occupational therapists may wish to recommend home modifications but unless a person's medication regime is optimised to minimise the causes of instability (because of adverse drug-drug effects) their input will be less meaningful. These examples depend on the type of input only a clinician can provide and increasingly research groups within this field are calling upon expert clinical help during protocol development and device creation. Psychologists, social workers, physiotherapists are

intrinsic cogs in the creative and evaluative process but unsatisfactory surrogates for assimilating clinical information relevant to the success or failure of the system under development. We feel more should be undertaken to encourage physicians, particularly Elderly Care specialists, into this area. The interest is there, as this survey shows, we just need to gather it.

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